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PSYCHOLOGICAL EVALUATION OF EUROPEAN ASTRONAUT APPLICANTS: RESULTS OF THE 1991 SELECTION CAMPAIGN. C. Fassbender, & K.-M. Goeters. German Aerospace Research Establishment (DLR), Hamburg, Germany.

INTRODUCTION. In summer 1991 the European Space Agency (ESA) performed its second selection campaign since 1977 in order to find 10 astronaut candidates (laboratory specialists and space plane specialists). An integral part of this selection process was the psychological evaluation according to the principals laid down in the study report "Definition of Psychological Testing of Astronaut Candidates". METHODS. After national preselections, 59 applicants participated in the psychological evaluation which consists of the assessment of operational aptitudes (basic cognitive and psychomotor functions) and personality traits (motivation, social capability, stress resistance). The test program included a diverse number of tests, questionnaires, behavioral ratings, biographical data, and semi-structured interviews. About 50 scores were available for each subject. RESULTS. A comparison of the test scores with the original normative data, culture-fairness of the psychological selection, and discriminant functions analyzing the assessment decisions will be presented and discussed. CONCLUSIONS. Since the psychological evaluation was finished just before the deadline of the abstract, quantitative results and conclusions cannot be given in this abstract but will be reported in the conference paper.

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THE PSYCHOLOGICAL RESULTS OF THE JAPANESE ASTRONAUT SELECTION. C. Sekiguchi, M.D*[1]., S. Yumikura, M.D*[1]., M. Kume, Ph.D[2]., and N. Okada, Ph.D[3]. 1) National Space Development Agency of Japan (NASDA), 2) Waseda University, 3) National Univ. of Yokohama. Japan

NASDA has started the recruitment of Japanese Mission Specialist (MS) candidates who will join the NASA MS training course in 1992. Finally, two MS candidates will be selected. Our selection schedule is as follows:

1) Recruitment period	July 1 to August 31, 1991
2) Phase I selection	September, 1991 English exam. General intelligence, Some psychological exams.
3) Phase 2 selection	November 1991 Medical exams at hospital Psychological and general Interviews
4) Phase 3 selection	March or April 1992 Special medical exams (LBNP, Rotary Chairs etc), Interviews, NASA Class II medical exams

Announcement of final Japanese MSs will be on May 1992. As the psychological exams, NASDA will use the anxiety test, mental activity test, psychosocial personality test, aptitude test, and semi-structured psychological interviews based on the psychological criteria which is determined by the international psychological working group. Since the selection process is in progress, the results will be presented and discussed at the panel.

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VALIDATION OF ASTRONAUT PSYCHOLOGICAL "SELECT-IN" CRITERIA. R. M. Rose, R.L. Helmreich, T. McFadden, P. A. Santy*, and A. W. Holland*. MacArthur Foundation, Chicago, IL; University of Texas, Austin, TX; UTMB, Galveston; and NASA Johnson Space Center.

INTRODUCTION. A optional astronaut selection strategy would select-in individuals on the basis of personality attributes associated with superior performance. METHOD. A test battery, the Astronaut Personal Characteristics Inventory (ASTROPCI) was developed which assesses positive and negative components of achievement motivation and interpersonal orientation and skills. The battery was administered to one hundred three Astronaut Candidates and sixty-six current U.S. Shuttle Astronauts. To determine performance, a series of conceptual areas related to space-flight performance were defined. Astronauts rated their peers on each of these dimensions. Ratings were obtained on all eighty-four current Astronauts (excluding those selected in 1990). In addition to peer ratings, supervisor assessments of the same dimensions were obtained for each Astronaut. RESULTS. Cluster and factor analytic techniques were employed to isolate subgroups of Astronauts. Those astronauts with both high achievement needs and interpersonal skills were most often rated among the top five by their peers and least often rated among the lowest five. A number of scales discriminated between Astronauts rated high and low on one or more performance dimensions. CONCLUSIONS. The results parallel findings from the personality assessment of individuals in other demanding professions, including aircraft pilots and research scientists, suggesting that personality factors are significant determinants of performance in the space environment.

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HUMAN FACTORS TRAINING OF SCIENCE ASTRONAUTS IN GERMANY: CONCEPT AND METHODS. D. Manzey & A. Schiewe. German Aerospace Research Establishment (DLR), Hamburg, Germany.

INTRODUCTION. Even though the significance of psychological issues of manned space flights is widely acknowledged, up to now very few attempts have been made in America or Europe to integrate some kind of psychological training within the normal training syllabus of astronauts. A human factors training program for science astronauts has been developed by the German Aerospace Research Establishment and approved as an integrated part of the biomedical training of five German astronaut candidates. METHODS The training program consisted of several elements: (1)Psychological training consisting of 4 two day-sessions with the topics "Communication and Cooperation","Stress-Management","Coping with Operational Demands" and "Effective Problem Solving in Groups." Training methods included lectures, group exercises, individual exercises, and group discussions.(2)Problem-oriented team supervision (POTS),integrated within the psychological training sessions and in the weekly "monday meetings" of astronauts. (3)Individual stress-management training during parabolic flights. (4) Training of psychomotor coordination under O-G conditions during parabolic flights. RESULTS AND CONCLUSIONS. The empirical results of the psychomotor training showed considerable improvement in O-G psychomotor performance. The predominant positive feedback of the astronauts who participated in this training program as well as an obviously improved team-efficiency which became evident during two follow-up POTS-meetings with the astronauts points to the success of this training approach.

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PSYCHOLOGICAL TRAINING OF NASA ASTRONAUTS FOR EXTENDED MISSIONS. A. W. Holland,* Behavior and Performance Laboratory, NASA Johnson Space Center, Houston, TX.

INTRODUCTION. The success of operational teams working in remote and hostile environments rests in large part on adequate preparation of those teams prior to emplacement in field settings. Psychological training, directed at the maintenance of crew health and performance, becomes increasingly important as space missions grow in duration and complexity. METHODS. Topics to be discussed include: the conceptual framework of psychological training; needs analysis; content and delivery options; methods of assessing training efficacy; use of testbeds and analogs; and the relationship of training to crew selection and real-time support activities. RESULTS AND CONCLUSIONS. This paper will discuss the psychological training approach being developed at the NASA/JSC Behavior and Performance Laboratory. This approach will be compared and contrasted with those underway in the U.S. Department of Defense and in other space agencies.

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HUMAN PERFORMANCE IN THE MODERN COCKPIT. R. K. Dismukes and M. M. Cohen.* NASA Ames Research Center, Moffett Field, CA 94035

This panel was organized by the Aerospace Human Factors Committee to illustrate behavioral research on the perceptual, cognitive, and group processes that determine crew effectiveness in modern cockpits. Earl Wiener will report on crew reactions to the introduction of highly automated systems in the cockpit. Automation can improve operational capabilities and efficiency and can reduce some types of human error, but may also introduce entirely new opportunities for error. Judith Orasanu will discuss the problem-solving and decision-making strategies used by crews led by captains with various personality profiles. Kevin Corker will present computational approaches to modeling the cognitive demands of cockpit operations and the cognitive capabilities and limitations of crew members. Asaf Degani and Earl Wiener will examine factors contributing to aircrew deviations from standard operating procedures and misuse of checklist, often leading to violations, incidents, or accidents. Walter Johnson, Mary Kaiser, and David Foyle will discuss the mechanisms of visual perception pilots use in aircraft control and the implications of these mechanisms for effective design of visual displays.